WHAT IS CLAIMED IS:

1.   A   method   for   encapsulating   a   plurality   of
packets into a frame, comprising:

receiving a plurality of packets at a station of a
plurality   of   stations   of   a   network,   each   packet
associated   with   a   delay   requirement,   the   delay
requirement reflecting a deadline corresponding to at
least a subset of the plurality of stations;

directing the plurality of packets to a plurality of
queues of the station;

detecting an available channel of the network;

determining that one or more packets at a queue of
the plurality of queues are ready to be encapsulated into
a   frame   in   accordance   with   the   delay   requirements
associated with the one or more packets; and

encapsulating the one or more packets into the frame
for transmission using the available channel.

2.   The   method   of   Claim   1,   further   comprising
selecting the queue of the plurality of queues by:

determining that the queue transmitted a colliding
frame involved in a collision; and

selecting   the   queue   in   response   to   the
determination.

3.   The   method   of   Claim   1,   further   comprising
selecting the queue of the plurality of queues according
to a selection procedure.

4.   The method of Claim 1, wherein determining that the one or more packets at the queue of the plurality of queues are ready to be encapsulated into the frame comprises:

5   receiving at the queue a current packet having a current packet size, the queue having one or more potential packets having a collective packet size, the one or more potential packets to be potentially encapsulated;

10   determining whether a sum of the current packet size and the collective packet size is greater than a maximum size corresponding to a payload of the frame; and

           determining that the queue has the one or more packets ready to be encapsulated into the frame if the

15   sum is greater than the maximum packet size.

5.   The method of Claim 1, wherein determining that the one or more packets at the queue of the plurality of queues are ready to be encapsulated into the frame comprises:

establishing that the queue has transmitted a previous frame, the queue having one or more remaining potential packets having a remaining collective packet size corresponding to a payload of the frame, the one or more remaining potential packets to be potentially encapsulated;

determining whether the remaining collective packet size is greater than a maximum packet size; and

determining that the queue has the one or more packets ready to be encapsulated into the frame if the remaining collective packet size is greater than the maximum packet size.

6.   The method of Claim 1, wherein determining that the one or more packets at the queue of the plurality of queues are ready to be encapsulated into the frame comprises:

predicting a next size of a next packet for the queue;

deciding that waiting for the next packet is associated with an expiration of a deadline; and

determining that the queue has the one or more packets ready to be encapsulated into the frame in accordance with the decision.

7.   The method of Claim 1, wherein determining that the one or more packets at the queue of the plurality of queues are ready to be encapsulated into the frame comprises:

5   predicting a next size of a next packet for the queue;

deciding that waiting for the next packet is associated with a packet loss rate that does not satisfy a threshold; and

10   determining that the queue has the one or more packets ready to be encapsulated into the frame in accordance with the decision.

8.   The method of Claim 1, wherein determining that
15   the one or more packets at the queue of the plurality of queues are ready to be encapsulated into the frame comprises:

predicting a next size of a next packet for the queue;

20   deciding that waiting for the next packet is not associated with an efficiency improvement; and

determining that the queue has the one or more packets ready to be encapsulated into the frame in accordance with the decision.

9.   A system for encapsulating a plurality of packets into a frame, comprising:

an input operable to receive a plurality of packets, each packet associated with a delay requirement, the delay requirement reflecting a deadline corresponding to at least a subset of a plurality of stations of a network;

a plurality of queues coupled to the input and operable to queue the plurality of packets;

a scheduler coupled to the plurality of queues and operable to:

establish that there is an available channel of the network;

determine that one or more packets at a queue of the plurality of queues are ready to be encapsulated into a frame in accordance with the delay requirements associated with the one or more packets; and

initiate encapsulation of the one or more packets into the frame for transmission using the available channel.

10.   The system of Claim 9, wherein the scheduler is further operable to select the queue of the plurality of queues by:

determining that the queue transmitted a colliding frame involved in a collision; and

selecting the queue in response to the determination.

11.   The system of Claim 9, wherein the scheduler is further operable to select the queue of the plurality of queues according to a selection procedure.

12.   The system of Claim 9, wherein the queue is further operable to calculate that the one or more packets at the queue of the plurality of queues are ready to be encapsulated into the frame by:

receiving at the queue a current packet having a current packet size, the queue having one or more potential packets having a collective packet size, the one or more potential packets to be potentially encapsulated;

determining whether a sum of the current packet size and the collective packet size is greater than a maximum size corresponding to a payload of the frame; and

determining that the queue has the one or more packets ready to be encapsulated into the frame if the sum is greater than the maximum packet size.

13. The system of Claim 9, wherein the queue is further operable to calculate that the one or more packets at the queue of the plurality of queues are ready to be encapsulated into the frame by:

5   establishing that the queue has transmitted a previous frame, the queue having one or more remaining potential packets having a remaining collective packet size corresponding to a payload of the frame, the one or more remaining potential packets to be potentially

10   encapsulated;

determining whether the remaining collective packet size is greater than a maximum packet size; and

determining that the queue has the one or more packets ready to be encapsulated into the frame if the

15   remaining collective packet size is greater than the maximum packet size.

14. The system of Claim 9, wherein the queue is further operable to calculate that the one or more

20   packets at the queue of the plurality of queues are ready to be encapsulated into the frame by:

predicting a next size of a next packet for the queue;

deciding that waiting for the next packet is

25   associated with an expiration of a deadline; and

determining that the queue has the one or more packets ready to be encapsulated into the frame in accordance with the decision.

15. The system of Claim 9, wherein the queue is further operable to calculate that the one or more packets at the queue of the plurality of queues are ready to be encapsulated into the frame by:

5   predicting a next size of a next packet for the queue;

deciding that waiting for the next packet is associated with a packet loss rate that does not satisfy a threshold; and

10   determining that the queue has the one or more packets ready to be encapsulated into the frame in accordance with the decision.

16. The system of Claim 9, wherein the queue is

15 further operable to calculate that the one or more packets at the queue of the plurality of queues are ready to be encapsulated into the frame by:

predicting a next size of a next packet for the queue;

20   deciding that waiting for the next packet is not associated with an efficiency improvement; and

determining that the queue has the one or more packets ready to be encapsulated into the frame in accordance with the decision.

17. Logic for encapsulating a plurality of packets into a frame, the logic embodied in a medium and operable to:

receive a plurality of packets at a station of a
5   plurality of stations of a network, each packet associated with a delay requirement, the delay requirement reflecting a deadline corresponding to at least a subset of the plurality of stations;

direct the plurality of packets to a plurality of
10   queues of the station;

detect an available channel of the network;

determine that one or more packets at a queue of the plurality of queues are ready to be encapsulated into a frame in accordance with the delay requirements
15   associated with the one or more packets; and

encapsulate the one or more packets into the frame for transmission using the available channel.

18. The logic of Claim 17, further operable to
20   select the queue of the plurality of queues by:

determining that the queue transmitted a colliding frame involved in a collision; and

selecting the queue in response to the determination.

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19. The logic of Claim 17, further operable to select the queue of the plurality of queues according to a selection procedure.

20. The logic of Claim 17, operable to determine that the one or more packets at the queue of the plurality of queues are ready to be encapsulated into the frame by:

5   receiving at the queue a current packet having a current packet size, the queue having one or more potential packets having a collective packet size, the one or more potential packets to be potentially encapsulated;

10   determining whether a sum of the current packet size and the collective packet size is greater than a maximum size corresponding to a payload of the frame; and

            determining that the queue has the one or more packets ready to be encapsulated into the frame if the

15   sum is greater than the maximum packet size.

21. The logic of Claim 17, operable to determine that the one or more packets at the queue of the plurality of queues are ready to be encapsulated into the frame by:

5   establishing that the queue has transmitted a previous frame, the queue having one or more remaining potential packets having a remaining collective packet size corresponding to a payload of the frame, the one or more remaining potential packets to be potentially

10   encapsulated;

determining whether the remaining collective packet size is greater than a maximum packet size; and

determining that the queue has the one or more packets ready to be encapsulated into the frame if the

15   remaining collective packet size is greater than the maximum packet size.

22. The logic of Claim 17, operable to determine that the one or more packets at the queue of the

20   plurality of queues are ready to be encapsulated into the frame by:

predicting a next size of a next packet for the queue;

deciding that waiting for the next packet is

25   associated with an expiration of a deadline; and

determining that the queue has the one or more packets ready to be encapsulated into the frame in accordance with the decision.

23. The logic of Claim 17, operable to determine that the one or more packets at the queue of the plurality of queues are ready to be encapsulated into the frame by:

5   predicting a next size of a next packet for the queue;

deciding that waiting for the next packet is associated with a packet loss rate that does not satisfy a threshold; and

10   determining that the queue has the one or more packets ready to be encapsulated into the frame in accordance with the decision.

24. The logic of Claim 17, operable to determine

15   that the one or more packets at the queue of the plurality of queues are ready to be encapsulated into the frame by:

predicting a next size of a next packet for the queue;

20   deciding that waiting for the next packet is not associated with an efficiency improvement; and

determining that the queue has the one or more packets ready to be encapsulated into the frame in accordance with the decision.

25. A system for encapsulating a plurality of packets into a frame, comprising:

means for receiving a plurality of packets at a station of a plurality of stations of a network, each

5   packet associated with a delay requirement, the delay requirement reflecting a deadline corresponding to at least a subset of the plurality of stations;

means for directing the plurality of packets to a plurality of queues of the station;

10 means for detecting an available channel of the network;

means for determining that one or more packets at a queue of the plurality of queues are ready to be encapsulated into a frame in accordance with the delay

15 requirements associated with the one or more packets; and

means for encapsulating the one or more packets into the frame for transmission using the available channel.

26. A method for encapsulating a plurality of packets into a frame, comprising:

receiving a plurality of packets at a station of a plurality of stations of a network, each packet associated with a delay requirement, the delay requirement reflecting a deadline corresponding to at least a subset of the plurality of stations;

directing the plurality of packets to a plurality of queues of the station;

detecting an available channel of the network;

selecting a queue of the plurality of queues by determining that the queue transmitted a colliding frame involved in a collision and selecting the queue in response to the determination, and by selecting the queue of the plurality of queues according to a selection procedure;

determining that one or more packets at the queue of the plurality of queues are ready to be encapsulated into a frame in accordance with the delay requirements associated with the one or more packets by:

receiving at the queue a current packet having a current packet size, the queue having one or more potential packets having a collective packet size, the one or more potential packets to be potentially encapsulated, determining whether a sum of the current packet size and the collective packet size is greater than a maximum size corresponding to a payload of the frame, and determining that the queue has the one or more packets ready to be encapsulated into the frame if the sum is greater than the maximum packet size;

establishing that the queue has transmitted a previous frame, the queue having one or more remaining potential packets having a remaining collective packet size, the one or more remaining potential packets to be potentially encapsulated, determining whether the remaining collective packet size is greater than a maximum packet size, and determining that the queue has the one or more packets ready to be encapsulated into the frame if the remaining collective packet size is greater than the maximum packet size;

predicting a first next size of a first next packet for the queue, deciding that waiting for the first next packet is associated with an expiration of a deadline, and determining that the queue has the one or more packets ready to be encapsulated into the frame in accordance with the decision;

predicting a second next size of a second next packet for the queue, deciding that waiting for the second next packet is associated with a packet loss rate that does not satisfy a threshold, and determining that the queue has the one or more packets ready to be encapsulated into the frame in accordance with the decision; and

predicting a third next size of a third next packet for the queue, deciding that waiting for the third next packet is not associated with an efficiency improvement, and determining that the queue has the one or more packets ready to be encapsulated into the frame in accordance with the decision; and

encapsulating the one or more packets into the frame for transmission using the available channel.